

STEP-WISE EXTINCTIONS AT THE CRETACEOUS/TERTIARY BOUNDARY AND THEIR CLIMATIC IMPLICATIONS; Florentin J-M.R. Maurrasse, Department of Geology, Florida International University, University Park Campus, Miami, FL 33199

A comparative study of planktonic foraminifera and radiolarian assemblages from the K/T boundary section of the Beloc Formation in the Southern Peninsula of Haiti, and the lowermost Danian sequence of the Micara Formation in southern Cuba reveals a remarkable pattern of step-wise extinctions. This pattern is consistent in both places despite the widely different lithologies of the two formations. The Beloc Formation rocks are essentially limestone and marls with intermittent volcanogenic basaltic turbidites at and above the K/T boundary, whereas the Micara Formation consists essentially of volcanogenic and epiclastic sediments with a high frequency of turbidites throughout. However, the exclusive abundance of pelagic fauna in both formations indicates with certainty their deposition in the pelagic realm. Both sections are greatly extended, similar to those at El Kef in Tunisia and the Brazos River, in Texas. As it has been demonstrated for the nannoplanktons in the latter section, (1) in the Caribbean islands, the biotic record show for instance that accepted Cretaceous taxa such as Gumbelitria and the heterohellicids are clearly overlapping into the determinable Tertiary levels.

Because of a step-wise extinction and the delayed disappearance of taxa known to be more representative of cooler water realms, it is inferred that a cooling trend which characterized the close of the Maastrichtian and the onset of the Tertiary had the major adverse effect on the existing biota. Although repetitive lithologic and faunal fluctuations throughout the Maastrichtian sediments found at DSDP site 146/149 in the Caribbean sea indicate variations reminiscent of known climatically induced cycles in the Cenozoic, rapid biotic succession appears to have taken place during a crisis period of a duration greater than 2 million years, from the Trinitella scotti Zone to the Morozovella pseudobulloides zone. Widespread and abundant volcanic activities recorded in the Caribbean area during the crisis period gives further credence to earlier contention (2) that intense volcanism may have played a major role in exacerbating pre-existing climatic conditions during that time.

- (1) Jiang, M.J. and Garner, S., 1986, Micropaleontology, v. 32, No. 3, p.232-255.
- (2) Maurrasse, F-J.M.R., 1986, Geological Society of America: Abs. v. 18, No. 6, p. 686.